# Site Engineering Report

## Hamilton Residence
## 40 Swifts Lane
## Darien, Connecticut

*Prepared for:*

James & Liane Hamilton
40 Swifts Lane
Darien, CT 06820

*Date Prepared:*

April, 2021

*Prepared by:*
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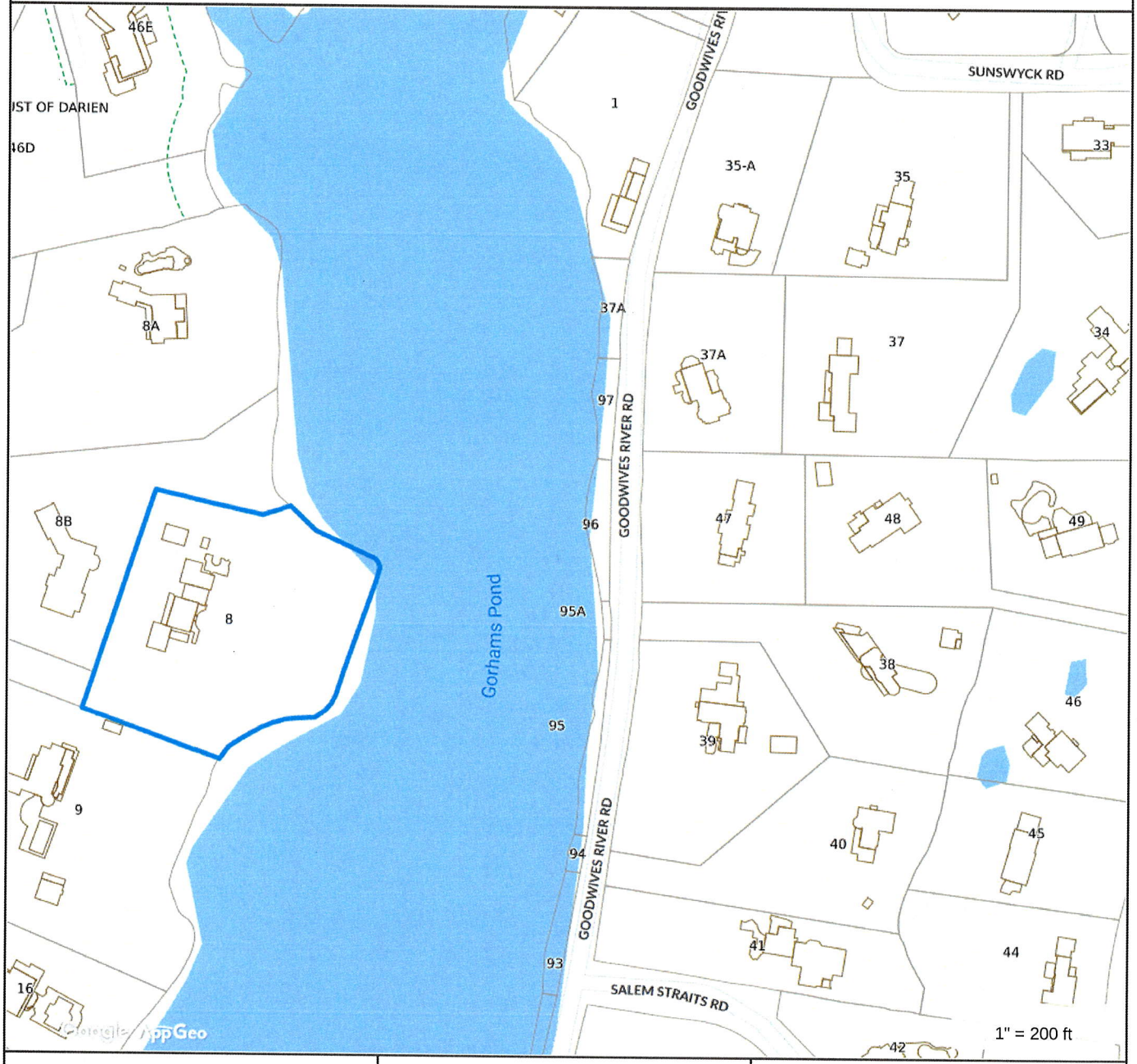
Town of Darien, CT

April 28, 2021

# 40 Swifts Lane




**Property Information**

| | |
|---|---|
| **Property ID** | 10510 |
| **Location** | 40 SWIFTS LANE |
| **Owner** | HAMILTON JAMES & |

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Darien, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 3/15/2021
Data updated 3/11/2021

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.

## Introduction

This report has been prepared to present technical information in support of the construction of a pool, pool patio and spa at 40 Swifts Lane, Darien, CT. Other proposed activity associated with this construction will be minor regrading and the installation of a stormwater management system. The property is located on the east side of Swifts Lane in the R-1 Residence zone of Darien.

## Existing Site Conditions

The property has a total lot area of 94,686± square feet or 2.1737± acres. The property is fully developed with the original house constructed in 1719 with a renovation completed in 2002 according to the Assessor's card. The access to the property is via paved driveway from Swifts Lane located parallel to the westerly property line.

The property is bordered by residential properties on three sides and Gorham's pond to the east.

The parcel slopes moderately to mildly from west to east. The property consists of manicured lawn east of the ornamental gardens that are around the existing house and there is a small wooded area east of the stonewall that parallels Gorham's Pond. There is a stonewall "seawall" that is located along the shore of Gorham's Pond with a break in the wall on the south end to be able to access Gorham's Pond. There are mature trees along the property boundaries and throughout the existing landscape.

There are no other wetlands on the property except for the edge of the water at Gorham's Pond.

The easterly portion of the site adjacent to Gorham's Pond has the one percent chance flood hazard line at elevation 10.7 according to the survey plan prepared by William W. Seymour & Associates, PC, Darien, CT

## Project Description

The proposal for this site consists of constructing a pool, pool patio and spa. Other work associated with this project will include minor regrading associated with the pool, pool patio and the installation of a subsurface stormwater management system to handle the water quality volume from the impervious areas related to the proposed pool.

## Stormwater Management Facilities

### Existing Site Runoff Characteristics

Currently the runoff from the house roof areas discharges into the ground with the outlets unknown and runoff from the driveway sheet flows across the lawn area in an easterly direction which ultimately flows to Gorham's Pond.

**Developed Condition Site Runoff Characteristics**

The proposed grading for the pool and pool patio will not change the overall drainage pattern. Once the regrading is completed the drainage pattern will be the same. Due to the property being located on Gorham's Pond which flows into Long Island Sound detention is not required. We are proposing to collect the water quality volume from the proposed pool and pool patio and treat the water quality volume. There will be one subsurface bio-retention area consisting of Cultec C-4 chambers to store the water quality volume from the proposed impervious areas. The water quality volume consists of the first inch of runoff. All other runoff from the site will sheet flow onto the ground and ultimately flow to Gorham's Pond.

The water quality volume for the proposed pool and pool patio will require a total of 156 cubic feet of storage for the first inch of runoff. The proposed subsurface bio-retention area consisting of Cultec C-4 chambers will have a total volume of 180 cubic feet of storage. This volume is equal to or greater than the water quality volume.

Per Section 880 of the Darien Zoning Regulations we are requesting a waiver of the requirements of Section 880 for a detailed stormwater management plan and drainage plan.

**Site Utilities**

**Sanitary Sewer**

The existing residence is connected to the sanitary sewer located in Swifts Lane via grinder pump.

**Water**

The site is connected to the municipal water main located in Swifts Lane.

**Sedimentation & Erosion Control Narrative**

Reference is made to the Sedimentation and Erosion Control Plan drawing, which, along with this text is included in the report, part of the Sedimentation and Erosion Control Plan for this project. All erosion controls are to follow the 2002 CT Guideline for Soil Erosion and Sediment Control.

Sedimentation and erosion controls for the lot will consist of silt fence placed on the down gradient side of all cut and fill areas and the installation of anti-tracking pads at the entrance of the construction access to the pool and pool patio. Sedimentation and erosion controls shown on the plan are specific to this property.

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# Appendix A:

# **Stormwater Management Operation and Maintenance Plan**

DiVesta Civil Engineering, LLC

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Stormwater Management
Operation and Maintenance Plan
For

40 Swifts Lane
Darien, Connecticut

April 30, 2021

The object of the stormwater management operation and maintenance plan is three fold; 1) is to collect the runoff from the proposed pool patio and convey the runoff into the subsurface bio-retention system, 2) once the runoff has been collected and conveyed to the subsurface bio-retention system the runoff will infiltrate into the surrounding soil, 3) the treatment system will detain the water quality volume of runoff from the pool patio before infiltrating into the surrounding soil before discharging into Gorham Pond.

Maintenance Measures

1. Inspect the channel drain and junction boxes sumps annually for any accumulation of sediment. If there is any accumulated sediment it shall be removed by hand.
2. Inspect annually the channel drain to ensure that it is clear and free of buildup debris and that there are no blockages and that the pipes are free flowing.
3. Removal of any accumulated sediment will ensure that the bio-retention systems will function properly.

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# Appendix B:

# **Water Quality Volume Calculations**

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# Water Quality Volume (WQV) Calculations

Hamilton Residence
40 Swifts Lane
Darien, Connecticut
Dated: April 28, 2021

## Water Quality Volume Calculations

Water Quality Volume (WQV) = ((1") (R) (A)) / 12
Where:
A = total area in square feet
R = 0.05 + 0.009 (I)
I = percent impervious cover

## Proposed Site Sub Catchment # 1: Available Storage = 180 cu-ft

A = 2,067 sf (pool, pool patio)
I = 95%

R = 0.05 + 0.009 (95%)
R = 0.905

WQV = ((1") (R) (A)) / 12
WQV = ((1") (0.905) (2,067 sf)) / 12
WQV = 156 cu-ft (required)

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# Appendix C:

# **Web Soils**

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Soil Map—State of Connecticut
(40 Swifts Lane)


Map Scale: 1:1,220 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 20, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 21, 2014—Aug 27, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 73C | Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky | 2.5 | 48.0% |
| 73E | Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky | 1.7 | 32.6% |
| W | Water | 1.0 | 19.3% |
| **Totals for Area of Interest** | | **5.3** | **100.0%** |

# State of Connecticut

## 73C—Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky

### Map Unit Setting

*National map unit symbol:* 2w698
*Elevation:* 0 to 1,550 feet
*Mean annual precipitation:* 36 to 71 inches
*Mean annual air temperature:* 39 to 55 degrees F
*Frost-free period:* 140 to 240 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Charlton, very stony, and similar soils:* 50 percent
*Chatfield, very stony, and similar soils:* 30 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Charlton, Very Stony

#### Setting

*Landform:* Hills, ridges
*Landform position (two-dimensional):* Backslope, shoulder, summit
*Landform position (three-dimensional):* Crest, side slope, nose slope
*Down-slope shape:* Linear, convex
*Across-slope shape:* Convex
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

#### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material
*A - 2 to 4 inches:* fine sandy loam
*Bw - 4 to 27 inches:* gravelly fine sandy loam
*C - 27 to 65 inches:* gravelly fine sandy loam

#### Properties and qualities

*Slope:* 3 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 1.6 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.17 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* Moderate (about 8.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 6s
*Hydrologic Soil Group:* B
*Ecological site:* F144AY034CT - Well Drained Till Uplands
*Hydric soil rating:* No

## Description of Chatfield, Very Stony

**Setting**

*Landform:* Ridges, hills
*Landform position (two-dimensional):* Backslope, shoulder, summit
*Landform position (three-dimensional):* Crest, side slope, nose slope
*Down-slope shape:* Convex
*Across-slope shape:* Linear, convex
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

**Typical profile**

*Oi - 0 to 1 inches:* slightly decomposed plant material
*A - 1 to 2 inches:* fine sandy loam
*Bw - 2 to 30 inches:* gravelly fine sandy loam
*2R - 30 to 40 inches:* bedrock

**Properties and qualities**

*Slope:* 3 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 1.6 percent
*Depth to restrictive feature:* 20 to 41 inches to lithic bedrock
*Drainage class:* Well drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* Low (about 4.3 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 6s
*Hydrologic Soil Group:* B
*Ecological site:* F144AY034CT - Well Drained Till Uplands
*Hydric soil rating:* No

## Minor Components

**Sutton, very stony**

*Percent of map unit:* 5 percent
*Landform:* Ground moraines, hills
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Rock outcrop**

*Percent of map unit:* 5 percent
*Hydric soil rating:* No

**Hollis, very stony**

*Percent of map unit:* 5 percent
*Landform:* Ridges, hills
*Landform position (two-dimensional):* Backslope, shoulder, summit
*Landform position (three-dimensional):* Crest, side slope, nose slope
*Down-slope shape:* Convex
*Across-slope shape:* Linear, convex
*Hydric soil rating:* No

**Leicester, very stony**

*Percent of map unit:* 5 percent
*Landform:* Drainageways, depressions
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

## Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 20, Jun 9, 2020